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DP OPERATIONS AND UNTAPPED TALENT

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ABSTRACT

This article describes a vocational habilitation program to train mentally disabled persons as electronic data processing (EDP) operations personnel. An economic rationale for employing disabled individuals is supported with market survey data, and the capabilities of disabled persons are shown in the preliminary results of a pilot EDP training program. Finally, a checklist to evaluate the potential suitability of a data centre operation for mentally disabled employees is presented.

The information industry, perhaps more than any other, has been responsible for closing the "yawning chasm"[1] between the principle of normalization and its full expression in the world of work. For many leading companies with EDP operations, the employment of disabled persons has required no greater rationale than exists for non-disabled persons — employment is based on ability to perform a given job. For other companies, the convincing success of disabled persons has stimulated a new appreciation of their value as employees. Performance evaluation studies have repeatedly shown that on measures of job performance, job stability, attendance and turnover, four of the more frequent performance evaluation criteria, persons with disabilities typically perform as well or better than their non-disabled counterparts.[2,3]

Employment of persons with disabilities in the information industry, and the predominant subject group participating in performance evaluation studies, has concerned those with physical disabilities who are engaged in sophisticated data processing operations, such as computer programming and systems analysis. An examination of educational and vocational training programs offered by major corporations like Control Data and 3M reveals a similar emphasis.[2] But there is yet another untapped human resource. This resource is the mentally disabled employee.

This article describes the rationale for using mentally disabled persons as electronic data processing (EDP) operations personnel. By relating EDP management concerns to the benefits of employing disabled individuals, demonstrable savings can be realized in the data centre.

The market feasibility for such employees was shown through a province-wide survey discussed in this article. In addition, an overview of an EDP training program and some preliminary results are presented along with sample training manual documentation for performing the standard data processing operation of "back-up". Finally, a checklist of how to analyze the suitability of a data centre for disabled employees, and the cost savings which could be realized by doing so, is described.

Rationale

Two of the major problems facing data processing operations management are recruitment/selection of employees, and maintaining employee motivation.[4] These management concerns are particularly evident in the case of basic data processing shop jobs where the assigned tasks are repetitive and where the job may offer few career development opportunities. As known precipitants of occupational stress, these job characteristics often produce profound adverse effects upon the employee's perceived sense of job satisfaction and actual productivity.[5] Among the most costly for the employer are increases in the frequency of counterproductive acts, absenteeism, and turnover rates. Each effect vastly inflates overhead costs which, according to Willson, [4] may increase the cost of an $18,000 operator's salary to $30,000 when retraining and recruitment costs are added alone.

The economic rationale for employing persons with mental disabilities is three-fold. First, and most important, is the objective of achieving a "best fit" or match between the abilities and attributes of the employee and the demands of the job, thereby increasing the likelihood of maintaining high levels of job satisfaction, productivity and job stability. Assigning a mentally disabled employee to those labour-intensive shop jobs which offer little task variation is one important example. Whereas boredom and job dissatisfaction may result from a daily routine of repetitive activities for some non-disabled employees, this job characteristic is suited to the mentally disabled employee whose accomplishments are exemplified by their very ability to sustain their performance over extended periods of time. As was discussed previously, positive work attitudes, as well as excellent work performance records, are characteristic of disabled employees.[3] Indeed, some have viewed disabled persons as committed and loyal employees who possess a strong work ethic and an appreciation of the value of work.[4]

Achieving a greater degree of concordance between the career aspirations of the employee and the career advancement opportunities offered in a position is another way of reducing the likelihood of job dissatisfaction and high turnover rates. This effect could be achieved in many basic data processing positions by employing mentally disabled personnel. The expectations of the mentally disabled employee would more closely match the career opportunities available in a non-career developmental position. This individual would be less likely to feel underemployed as they worked within

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the upper levels of their abilities and skills.

A second economic benefit would be realized in the form of reduced recruitment costs. The availability of well-trained mentally disabled personnel would increase the labour pool from which the data centre operations manager could draw. An easily accessible labor market would reduce both recruitment time and direct expenditures for advertising. Of course, it should be recognized that the mentally disabled employee would require a longer period of start-up training following their recruitment.[4] But the provision of on-site training and follow-up services usually offered by vocational training centres would compensate for this difference.

Finally, various Government-sponsored employment programs offer incentives to firms willing to hire disabled employees.

Data Centre Employment Opportunities

The availability of EDP jobs for mentally disabled persons, and the willingness of industry to hire these individuals, was shown in a province-wide market survey of 486 Alberta firms.[6] Forty-five of the 92 respondents, representing a wide cross-section of employers in Government, business and industry, indicated that they would hire mentally disabled persons who had been trained to perform basic EDP jobs.

Descriptive statistics showing the average number of EDP jobs in those firms willing to hire disabled individuals, and the number of positions suitable for mentally disabled employees, are presented in Table 1. Employment positions in four occupational categories were considered appropriate for disabled workers. The four categories were: Junior Computer Operator, Remote Job Entry Terminal Operator, Production Control Clerk and Media Librarian. These categories were selected as most appropriate on the basis of job descriptions which emphasized labour-intensive manual tasks, and other skills that could be acquired by a disabled individual.[4] Representative tasks would include bursting and decollating of line printer output, mounting of data processing media, and start-up or shut-down operations.

Table 1

Means and standard deviations of EDP jobs in respondent firms

	All EDP Jobs		EDP Jobs For Mentally Disabled	
Industry	**Mean**	**SD**	**Mean**	**SD**
Oil, Gas & Mining (n = 9)	27.4	32.4	5.8	4.3
Trade (n = 9)	12.0	17.2	2.3	2.2
Government (n = 8)	30.4	28.0	3.5	3.5
Manufacturing (n = 4)	2.8	2.8	1.5	3.0
Utilities (n = 3)	200.0	92.9	24.3	15.9
Education (n = 2)	122.5	164.8	47.0	63.6
Computer Services (n = 2)	9.5	3.5	2.5	3.5
General Services (n = 2)	16.5	19.1	7.0	8.5
Other (n = 6)	18.8	30.8	3.0	3.0
Total (N = 45)	36.0	72.8	6.7	13.5

The 45 respondents reported an average of 6.7 jobs of this description for a total of approximately 300 positions that employers would consider hiring a disabled person. Overall, the number of suitable positions would comprise about 20% of the total number of EDP jobs. Of course, these figures do not reflect the number of unfilled positions currently available. The number of actual openings that could be expected during a one-year period was estimated on the basis of employee turnover rates and each firm's expectation of adding new positions.

Sixteen of the respondents expected to hire between one and four additional EDP employees within a two-year period. Since about 50% of these new positions were identified as basic EDP jobs, there would be approximately 4 - 16 positions created annually. Assuming a conservative turnover rate of 15% of the 300 basic EDP jobs identified in this sample, and given the expected addition of new jobs, the 45 respondents alone could provide between 49 to 61 employment opportunities annually for mentally disabled persons. The total number of EDP jobs that could be made accessible to disabled persons is likely to be much larger if these figures were extended to include the non-respondent firms as well.

These results clearly show the market demand for basic data processing operations personnel, and the willingness of industry to hire disabled persons to meet this demand. The final ingredient necessary to expand the vocational options of mentally disabled persons into the information industry is an effective training program.

Electronic Data Processing Training Program

Extensive developments in vocational training strategies within the past decade have created a much broader scope of vocational options for mentally disabled persons. Comprehensive reviews and detailed descriptions of this training technology have been presented elsewhere,[7,8,9,10] so they will not be reiterated here. Instead, this section will detail one application of these strategies: the Electronic Data Processing Training Program.[11]

Training in EDP operations for mentally disabled adults was initiated by Western Industrial, Research and Training Centre (WIRTC), a vocational training facility for disabled persons. This organization is operated in a fashion comparable to any competitive industry. Its organizational structure, manufacturing and marketing methods, and expectations for clients closely approximate the environment in which disabled persons will subsequently be employed. Maintaining ecological validity in all aspects of training is a primary objective. Task sequencing of jobs and skills, contingencies of reinforcement, acquisition training, production, and evaluation all reflect a real work environment. Where WIRTC does differ from competitive industry is in the provision of comprehensive individualized vocational programs that develop and maintain individual capacities, as well as providing for evaluation, placement and follow-up services.

Central to the training programs is the Industrial Model Vocational Training Systems (IMVTS), a comprehensive program designed to teach 30 general work skills that are prerequisite to specific skills training and competitive employment.[12] Acquisition of general work behaviours, as defined by the IMVTS, occurs as a fundamental first step in the graduated programming[13] sequence. Clients may then progress to specific skill programs or pre-employment training prior to job placement.

A criterion-referenced approach[14] is applied to all aspects of the training process; beginning with the initial assessment of entry level skills, through the intermediate phases of skill acquisition, production and maintenance, and concluding with the mastery level exit criteria. Minimum performance standards of quality and speed are designed to meet competitive employment criteria derived from industrial norms. Otherwise, time studies and quality control methods[15] are used to set performance standards.

The EDP program was developed for mentally disabled adults who possess a degree of personal and vocational independence. Mastery of the IMVTS work behaviours, and a working knowledge of basic arithmetic, reading and writing are prerequisite entry level behaviors.

A two-level training sequence, consisting of clerical skills training at level one and EDP at level two, is subdivided into specific training modules at each level (Table 2). Preceding the EDP portion of the program with clerical skills training allows for progressive task complexity suitable for the client's ability and potential work activity. Should EDP training prove to be inappropriate for any client, then that person could exit the program to seek competitive employment in a clerical position. Clerical skills training also enables the trainee to perform a variety of support services that are likely to be required within a data processing operation. For example, the distribution of line printer output to user departments is a clerical task acquired in the first level.

Table 2

Electronic data processing program modules

Level 1 (Clerical)	Level 2 (EDP)
Office behaviours	Shut down computer
Metering mail	Bring system up
Distribution	Back up
Photocopying/duplication	Data entry (accounting)
Timesheet preparation	Bursting*
Paper shredding/bundling*	Decollating*

Note. Documentation for modules with an asterisk (*) in development.

Each module provides a task description, the setting and materials required, and a detailed content task analysis. The latter provides a step-by-step instructional sequence that permits specific chaining techniques[7] to be applied. When on-line computer operations are trained, the additional feature of indicating the effect of each operator action is included in the task analysis. Thus, the actual computer response can be verified against the expected response to ensure accuracy or indicate when corrective action is needed. The following segment is a portion of the "back-up" module where the back-up tapes are dated following the transfer of information from the disk drive of a mini-computer.

Computer:	(Terminal on) Displays "Filename" on the terminal screen.
Operator:	Depress "CR" carriage return key.
Computer:	Displays "Partition in use Type "C" to continue"
Operator:	Type "C"
Computer:	Displays "Mapped Nova 3 RDOS REV 6.70 M/D/Y (month/day/year) and beeps.
Operator:	Type the month/day/year, putting a slash between each. Example: 10/25/84 Depress "CR" carriage return key.
Computer:	Displays "Time H/M/S" (hours/minutes/seconds.)
Operator:	Types in the time using a 24 hour clock. Example: 10:30:15 Depress "CR" carriage return key.
Computer:	Displays "R".
Operator:	Type "Go". Depress "CR" carriage return key.
Computer:	Displays "System Start Routine".
Operator:	Wait for prompting shown in next step.
Computer:	Displays "Enter System Password".

The example above was intentially included to show the level of training sophistication that has been achieved on a production computer. It must be recognized, however, that these tasks are routine ones that do not require an extensive knowledge of computer software. Most on-line functions would be the responsibility of an experienced console operator who could supervise the trainee graduate in the areas of mounting tapes and discs, paper handling and like tasks.

Preliminary Results

At the time of writing this report, a pilot EDP training program for five mentally disabled adults has been underway for approximately 12 months. This period has been devoted mainly to program development, testing and modifying each training module, and other program evaluation procedures.

Our preliminary results can be conveyed best by a brief description of the current progress of each trainee. One trainee, M.C., age 31, an individual with over ten years in sheltered employment, successfully progressed through level one within eight months. She now participates in a work experience program doing clerical and data processing tasks in the finance department of a large general hospital. A second trainee, S.M., age 35, is currently completing the final evaluation stage which precedes a work experience placement. Two trainees, T.D., age 35, and R.P., age 32, have progressed through level one and are entering the evaluation stage for progress into level two. The fifth trainee, E.B., age 24, re-evaluated his goals and left the program to seek employment in another field.

Trainees who continued in the program progressed through each level only by meeting stringent mastery criteria set at employment standards. Following the acquisition phase, and prior to a full-time work experience placement, they also were required to maintain their production levels for a period of not less than three months when supervision was reduced to normal working levels. If the quality or quantity of work produced fell below employment standards, then additional training or other trainee assistance programs (e.g., counselling) were implemented.

A job analysis of the work placement setting is conducted prior to the actual placement in order to prepare the trainee for any variations in the tasks or equipment used. On-site generalization training is then provided until the graduate trainee can independently meet the expectations and standards of the employer. Only one trainee has progressed to this stage and she completed the generalization training in slightly less than 3 weeks.

Overall, these preliminary results have been exceptional on all evaluation criteria applied to the program. Perhaps the most important is simply that mentally disabled adults are capable of making a valuable contribution to the information industry, handling sophisticated equipment and conducting themselves in a professional manner. For the disabled individuals themselves, the opportunity to work in a high technology field, with all of its mystic and status, has dramatically altered their self-appraisals and those of their families. We have detected these shifts in as small an effect as better grooming and dress, and in as large an effect as greater enthusiasm, effort and willingness to learn. Any initital skepticism or fear has long since been replaced with an appreciation of what can be achieved.

Analyzing the Data Centre

The following checklist is designed to assist the data operations centre in determining the suitability of the operation for the mentally disabled individual who has received the kind of training discussed in this article. Section A itemizes some basic requirements of the EDP centre. Graduate trainees would be targeted for companies with medium to large installations that could provide a sufficient volume of basic dp tasks for at least one full time employee. The availability of supervisory staff also would be essential. An ideal setting would possess all of these characteristics.

Items in section B represent areas where substantial cost savings may be realized by employing disabled individuals. An affirmative response on any item should encourage the data centre manager even further to extend employment opportunities to disabled individuals.

A) Basic Requirements

1) Installation type: mini-computer or larger — Yes No
2) Currently employ basic dp operations personnel — Yes No
3) Volume of dp work (e.g. tape mounting, bursting, decollating) or combination of clerical and dp tasks requires full-time employee — Yes No
4) Supervisor present on each shift — Yes No
5) Could incorporate on-site training provided by training centre personnel — Yes No

B) Operational Cost Savings

6) Moderate to high turnover in basic dp jobs — Yes No
7) Productivity loss due to job dissatisfaction or other related factors — Yes No
8) Available positions not filled immediately — Yes No
9) Conduct own training program for new staff in dp operations — Yes No
10) Expenditures made for job advertising/recruitment — Yes No
11) Expect to hire additional personnel for basic EDP jobs — Yes No

Summary

The electronic data processing program is a new venture in skill training for mentally disabled adults. Through the application of advanced training technology, mentally disabled adults have demonstrated their ability to acquire basic data processing skills and to use these skills effectively in the data centre. Equally important, industries with EDP operations have indicated their need for well-trained EDP personnel and their willingness to hire mentally disabled individuals to meet this demand. Thus, we have attempted to show that by expanding vocational training in the high technology field of information processing, firms with EDP operations and individuals with a mental disability can serve each other in an economically viable and socially responsible way.

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